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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,206	05/03/2001	Philip Guy	82402-3801	9235

7590 08/21/2002

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EXAMINER

CHUNDURU, SURYAPRABHA

ART UNIT PAPER NUMBER

1637

DATE MAILED: 08/21/2002

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/720,206

Applicant(s)

GUY ET AL.

Examiner

Suryaprabha Chunduru

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-23, 28-38 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Acknowledgement is made for the request to establish continued prosecution application (CPA) (Paper NO. 16) filed on July 26, 2002. The request for CPA is accepted and is established with the status of the application as follows:

a. the filling date of this CPA is established as 5/3/2001; b. Claims 28-38 are pending.

Response to Arguments

2. Applicants' response to the earlier office action (Paper No. 15) filed on July 26, 2002 has been entered.

3. Applicants' response to the office action (Paper No.15) is fully considered and deemed persuasive.

4. With respect to the rejection made in the previous office action under 35 U.S.C. 102(b), applicants' amendment and arguments have been considered but are moot in view of the new ground(s) of rejection.

5. With respect to the rejection made in the previous office action under 35 U.S.C. 103(a), Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

New Issues

6. The disclosure is objected because of the following informalities:

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: information regarding priority applications claimed in the specification is missing.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 28-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (Proc.Natl.Acad.Sci.USA., Vol. 93, pp: 5682-5687, 1996) and in view of Bailey et al. (WO 98/12913).

Anderson et al. teach a method for measuring the levels of nonsymbiotic plant hemoglobin in soybean plant tissue wherein Andersson et al. disclose that the method comprises measuring nonsymbiotic hemoglobin gene levels in shoots, roots, germinating seeds and of soybean plant (see page 5683, column2, paragraph 1). Andersson et al also disclose that (i) the

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nonsymbiotic hemoglobin levels were higher in root elongation (germination), cotyledons and stem (see page 5686, column 2, paragraph 2); (ii) function of nonsymbiotic hemoglobin as a facilitator of oxygen diffusion in dividing cells and as an oxygen sensor to meet increased demand (stress conditions) for oxidative respiration (see page 5686, column 2, paragraphs 1-2). However, Andersson et al. did not teach a method of improving the agronomic properties of a plant under stressful conditions.

Bailey et al. teach a method for improving the agronomic properties of a plant wherein Bailey et al. disclose that the method comprises transforming a plant and providing a regenerated plant with increasing intracellular oxygen-binding protein (for example hemoglobin, leghemoglobin etc.) (see page 4, lines 10-18, page 30, lines 10-15, claim 15). Bailey et al. also disclose that the improved agronomic properties include rapid germination, improved vegetative yield (seedling vigour) and high levels of secondary metabolites whose production is oxygen sensitive (fermentation products) (see page 6, lines 19-29). Further Bailey et al. disclose that (i) the generation of plants with improved agronomic characteristics include metabolically engineering an increased oxygen level or increased utilization (uptake) of oxygen (see page 4, lines 10-18); (ii) increased drought tolerance (hypoxic conditions) (see page 9, lines 19-22); (iii) the transformed plants and their progeny are selected or screened (to use in plant breeding) plants that express the desired protein or altered expression of the oxygen binding protein (hemoglobin) which has the agronomic characteristics by the procedures well known in the art (see page 11, lines 12-21, page 12, lines 15-33, page 13, lines 6-15).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to modify a method of using nonsymbiotic haemoglobin to

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increase cellular oxygen in plants as taught by Andersson et al. with a method of improving agronomic properties of plants as taught by Bailey et al. to achieve expected advantage of improving agronomic properties of plants because Andersson et al. states that "the high levels of nonsymbiotic hemoglobin is perhaps associated with high levels of metabolic activity. Nonsymbiotic hemoglobin genes are all expressed in various metabolically active tissues such as developing seeds and roots. It is possible that the nonsymbiotic hemoglobin is facilitating intracellular diffusion of oxygen to mitochondria in metabolically active cells in order to meet an increased demand for oxidative respiration" (see page 5686, column 2, paragraph 2) One such demand for oxygen demand, expressly motivated by Bailey et al. is to use oxygen-binding properties in plants to improve agronomic properties of a plant. An ordinary practitioner would have been motivated to combine the method of Bailey et al. with the method of Sowa et al. in order to achieve the expected advantage of developing a rapid and sensitive method for improving agronomic properties of plants.

No claims are allowable.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 703-305-1004. The examiner can normally be reached on 8.30A.M. - 4.30P.M, Mon - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 703-308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0294 for regular communications and - for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.


Suryaprabha Chunduru
August 14, 2002


JEFFREY FREDMAN
PRIMARY EXAMINER